C. Remarks

The claims are 1-18 and 20, with claims 1, 7, 13 and 20 being independent. Non-elected claim 19 has been cancelled without prejudice or disclaimer of the subject matter recited therein. Claims 1 and 7 have been amended to better define the present invention. New claim 20 has been added. Support for the amendment and the new claims may be found, inter alia, in the drawings. With respect to claim 7, Applicant notes that the pressure gradient as claimed is inherently formed when the reaction chamber 101, for example, as shown in the drawings is exhausted via the exhaust mechanism, which is closer to the plasma region than to the substrate. No new matter has been added. Reconsideration of the present claims is expressly requested.

Claims 1-6 stand rejected under 35 U.S.C. § 112, second paragraph, for being allegedly indefinite. Specifically, the Examiner alleged that the recitation regarding the mechanism is not clear.

In response, Applicant has amended claim 1 to clarify this feature. Accordingly, it is respectfully requested that the rejection be withdrawn.

Claim 1-18 stand rejected under 35 U.S.C. § 102(b) as being allegedly anticipated by U.S. Patent No. 6,200,431 B1 (Sone). The grounds of rejection are respectfully traversed.

Prior to addressing the merits of rejection, Applicant would like to briefly discuss some of the key features and advantages of the presently claimed invention. That invention is directed, in pertinent part, to a processing apparatus in which an object is treated with plasma. In this apparatus, an object of the treatment may be arranged such that

it is closer to the gas introducing part than to a plasma generating region and between the gas introduction part and the plasma region in the flow of the gas. Also, the apparatus may contain an exhaust mechanism, which is arranged closer to the plasma generating region than to the object creating a pressure gradient such that the pressure in the plasma processing region is lower than at the substrate. The apparatus may further contain a mechanism for maintaining a concentration of active species from 10^9 to 10^{11} cm^{-3}. As a result of such a structure, the apparatus improves the uniformity of and control over the thickness of the film than may be formed on the object.

Sone discloses an oxidation processing chamber. The reaction chamber is separated into a plasma-producing space and the substrate side by a grid plate. A gas shower head and an exhaust passage are arranged in each area. It is clear that Sone does not disclose a mechanism for arranging the substrate between the gas introducing part and the plasma region. In Sone, the gas introducing part is arranged between the substrate and the plasma-producing space.

Furthermore, Sone teaches that the exhausts are such that the pressure in the plasma producing space should be higher than the pressure in the substrate side to prevent the reactive gas from flowing into the plasma processing space (col. 9, lines 13-15). Accordingly, Applicant respectfully submits that the exhaust mechanism as recited in claim 7, which creates a lower pressure in the plasma processing region than at the substrate, is different from the exhaust in Sone.

Sone's sputtering apparatus separates a flow of a sputter gas GA from a flow of a reactive gas GB at the grid plate 6. Plasma gas is confined between the grid plate

6 and the target 1. The confined plasma is mainly used to sputter the target and hardly reaches the substrate through the grid plate. Thus, the plasma activated species can be prevented from damaging the surface of the substrate, which is undergoing a deposition.

The reactive gas GB occupies the space between the grid plate and the substrate and does not easily diffuse toward the target via the openings in the grid plate. Such a configuration in Sone prevents the reactive gas form being depleted so that a sufficient reaction rate with the sputtering target atoms can be achieved to efficiently deposit film on the substrate. Controlling the reactions between the target that the reactive gas improve the sputtering rate of the target and deposition speed. This control is exercised, for example, through pressure (exhaust) control, which is different from the presently claimed invention, as mentioned above.

Sone discloses that a part of the gas in the plasma generating region 5 may flow to the substrate side. However, to do so, the exhaust located on the substrate side should be arranged closer to the substrate than to the grid plate 6. Accordingly, Applicant submits that Sone does not disclose "an exhaust mechanism, which is arranged closer to the plasma generating region than the object, for exhausting the gas."

With respect to claim 13, the Examiner has not shown where Sone teaches a mechanism for maintaining a concentration of active species from 10^9 to 10^{11} cm^{-3}, which allows the formation of an extremely thin film (see page 15, lines 7-18). With respect to new claim 20, Sone is not understood to disclose the arrangement of components as recited therein. For example, Applicant submits that Sone does not disclose a plasma generating

part for generating the plasma in a flow of the gas and a mechanism that arranges the object in the flow of the gas further upstream than the plasma in the flow of the gas.

Accordingly, Applicant submits that Sone cannot affect the patentability of the presently claimed invention. Wherefore, it is respectfully requested that the outstanding rejections be withdrawn and that the present case be passed to issue.

Applicant's undersigned attorney may be reached in our New York office by telephone at (212) 218-2100. All correspondence should continue to be directed to our below listed address.

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